Tunable laser for long-haul systems

For Q4/2001 **Fujitsu Network Communications Inc** (a US$2bn division of Fujitsu Ltd Richardson, TX, USA) is adding 22-channel tunable laser capabilities to its FLASHWAVE OADX (currently shipping with 4-channel lasers), the world's largest-capacity long-haul system (capable of carrying 1.76 Tb bi-directionally).

"Fujitsu was one of the first optical transport companies shipping 4-channel tunable lasers in May 2000 and we are the only company with tunable lasers in carrier networks with live traffic," said executive vp and chief operating officer Ron Martin.

Fujitsu's 22-channel single-substrate tunable laser has an optical output power of up to 20 mW, combining eight separate temperature-tuned distributed feedback lasers, waveguides, silicon optical amplifiers and control circuitry. A fully-equipped FLASHWAVE OADX with 176 channels requires only eight spares, compared to 44 with a 4-channel laser, or 176 spares with a fixed-wavelength laser.

According to RHK, Fujitsu Network Communications was the number-one SONET Metro equipment supplier in 2000, with 42.3% share of a US$5.5bn market - nearly 20% more than the closest competitor.

Avalon qualifies multi-wafer MOCVD reactor; appoints production manager

Avalon Photonics Ltd has qualified its new AIXTRON multi-wafer MOCVD reactor at its VCSEL manufacturing facility in Zurich, Switzerland (allowing epitaxy productivity to be increased up to 20-fold over the next year).

A total of US$14m has been invested in first-round financing. This offers the potential for oxide-confined VCSELs matching the reliability of ion-implant VCSELs, says Avalon's CEO Karlheinz Gulden.

Avalon currently produces high-end 4- and 12-channel 3.125 Gb/s arrays for multi-channel datacom interfaces, but is developing 850 nm 10 Gb/s VCSELs for high-speed datacoms in storage and backbone applications.

* Avalon has appointed:

• Dr Uwe Thiemann as Production Manager (formerly Technical Manager at ABB Semiconductors AG) to oversee the transition from a small-batch R&D facility to a systems-driven production operation (embracing lot tracking, yield reporting, production planning and continuous improvement);

• Chris Keller (formerly Director of Sales at Picolight and part of a Fiber Optic and VCSEL sales team at Honeywell) as vice president of Sales (based in Silicon Valley; Tel: +1-408 379 8162). Keller will be targeting high-speed board-to-board parallel fibre interconnect and transceiver manufacturers.

EMCORE launches CWDM VCSELs; chosen for 10 Gb/s transceivers

EMCORE Corp (Somerset, NJ, USA) has launched a new family of four 778, 800, 825 and 850 nm Course Wavelength Division Multiplexing oxide VCSELs. Each operates at 3.125 Gb/s, enabling transceivers to transmit with an aggregate bandwidth of over 10 Gb/s down a single multi-mode fibre. EMCORE has demonstrated rates of up to 12.5 Gb/s.

The CWDM oxide VCSELs have been selected by:

• **Blaze Network Products** (Dublin, CA, USA) to drive the development of CWDM modules for short-reach (10 Gb/s, OC-192) and extended-reach (1 Gb/s) datacoms ("first-to-market with the smallest pluggable 10 Gigabit transceiver in the industry," says president Brian Peters). The 10 Gb/s module (designed for optical connect applications under 300 m, including LANs such as Gigabit Ethernet and Fiber Channel) is the first of its kind on the market.

• **Cognet MicroSystems** (Los Angeles, CA, USA) - which recently became a division of Intel - for use in its high-speed CWDM datacom module for short-reach applications. "*Short-wavelength CWDM is an attractive technology for extending the reach of multi-mode fibres*," says Cognet's president and CEO Bahram Jalali.

AXT's 2.5 Gb/s VCSEL arrays

After in April announcing volume production of 3.125 Gb/s 850 nm oxide-confined VCSELs (see Issue 4, page 29), in May the VCSEL/Laser Diode Technologies Division of **AXT Inc** (Fremont, CA, USA) announced volume production of 850 nm oxide-confined VCSEL arrays in 1x12 and 1x4 configurations (used in short-reach optical interconnections and optical transceiver applications, including InfiniBand designs). Each device can be modulated at data rates in excess of 2.5 Gb/s, i.e. 10 Gb/s (OC-192) for the 1x4 array and 30 Gb/s for the 1x12 array.

Honeywell's 2.5 Gb/s VCSELs

The VCSEL Products Division of **Honeywell** (Richardson, TX, USA) is now in full production of its 850 nm oxide-isolated VCSELs.

A power monitor diode can be used with appropriate feedback control circuitry to set a maximum power level for each VCSEL. Built-in power attenuation lowers the effective slope efficiency. Combined, these simplify design for high-data-rate communication and eye safety. In addition, the low drive current makes direct drive from PECL (Positive Emitter Coupled Logic) or ECL (Emitter Coupled Logic) gates possible and eases driver design.

"*Extensive work in understanding the oxide VCSEL process interactions and effects on long-term reliability has resulted in a product approaching the reliability of our successful ion implant VCSELs*," says vp and general manager Paul Chapman.

• **ElectroniCast** forecasts that the VCSEL transceiver market will exceed US$3.4bn by 2004.